REMARKS/ARGUMENTS

The claims are 4-7 and 9-21 which have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Steele U.S. Patent No. 2,906,859* in view of *Ogilvie et al. U.S. Patent No. 4,758,707*.

This rejection is respectfully traversed and reconsideration is expressly requested.

As set forth in claim 21, Applicant's invention provides a method for controlling a welding process using a melting welding wire and a welding torch in which at least one mechanical adjustment process is carried out during the welding to determine the position of the welding wire using the welding wire as a sensor, the welding wire is contacted with a workpiece by moving the welding wire towards the workpiece, and after contacting of the welding wire with the workpiece, the welding wire is moved away from the workpiece to a fixedly pregiven or adjustable distance relative to the workpiece.

The primary reference to *Steele* fails to disclose or suggest these features. Although the Examiner refers to col. 5, lines

22-53 and col. 8, lines 26-64 of *Steele* as disclosing a method for controlling a welding process carrying out at least one mechanic adjustment process during the welding to determine the position of the welding wire using the welding wire as a sensor, it is respectfully submitted that the Examiner's position is unfounded.

Even if *Steele* shows in FIG. 2 an embodiment where the electrode holder 13' is maintained in position and the nip rollers 16' can be moved to adapt the arc length, it is respectfully submitted that *Steele* fails to disclose or suggest a mechanical adjustment process carried out during the welding process. As can be seen from column 8, lines 26 ff. of *Steele*, the electrode 12 touches the workpiece for the ignition of the arc. To enable the ignition, the electrode is retracted and the arc is started with the aid of high frequency discharge. As can be further seen from column 2, lines 61-65, *Steele* also provides for starting the arc with the aid of a high frequency discharge of minimum duration.

It is respectfully submitted that *Steele* fails to disclose or suggest a method where the welding wire contacts the workpiece by moving the welding wire towards the workpiece and, after

contacting of the welding wire with the workpiece, moving the welding wire away from the workpiece to a fixedly pre-given or adjustable distance relative to the workpiece. During the welding process according to *Steele*, the welding wire does not contact the workpiece for carrying out a mechanical adjustment process to enable a precise adjustment of the distance of the end of the welding wire from the workpiece. In *Steele*, the movement of the nip rollers 16' or the electrode holder 13 is carried out to adapt the arc gap during the welding process. For this purpose, the arc voltage is measured and compared to a pre-selected value. When the arc voltage is above the pre-selected value, the electrode will be moved towards the workpiece to shorten the arc gap. Conversely, if the arc voltage is too low, the motor moves in a direction to lengthen the arc gap. See col. 5, lines 34-46 of *Steele*. As can be seen from Applicant's disclosure, the distance of the end of the welding wire from the workpiece cannot be precisely determined by measuring the welding voltage or welding current of the arc. Applicant's method as recited in claim 21 avoids this disadvantage and enables a precise adjustment of the distance between the end of the electrode and the workpiece during the welding process.

As can be seen from FIG. 4 of Applicant's disclosure, for instance, the mechanical adjustment process 41 is carried out after a number of pulse current phases 34 during the welding process. Usually the welding process is carried out with a pulse frequency of 20-70 Hz showing that the duration of the mechanical adjustment process is in the range of few milliseconds. Such a fast adjustment process would be impossible by moving the electrode holder 13 or nip rollers 16' according to *Steele* by means of a motor armature 21, shafts 22, 23, worm gear set 24, 26, worm-wheel 18, shaft 17, pinion gear 16 and rack 14. See FIG. 1 of *Steele*.

According to Applicant's method as set forth in claim 21, the movement of the welding wire is reversed during the mechanical adjustment process 41 as can be seen from FIG. 4 of Applicant's disclosure, for instance. A movement of the welding wire in a backward direction cannot be performed with the apparatus according to *Steele*. According to *Steele*, only a movement of the welding wire in a direction towards the workpiece is possible and intended. The movement of the welding wire in the direction towards the workpiece can only be slightly amended by the movement of the nip rollers 16' to adjust the arc length during welding. To enable a backward movement of the electrode

with the embodiment according to *Steele*, the movement of the nip rollers 16' away from the workpiece would have to be faster than the movement of the electrode towards the workpiece which simply would be impossible, in practice. According to *Steele*, it is impossible to precisely adjust the distance of the end of the electrode to the surface of the workpiece during the welding process.

The defects and deficiencies of the primary reference to *Steele* are nowhere remedied by the secondary reference to *Ogilvie et al.* There is no disclosure or suggestion in *Ogilvie et al.* of a method for controlling a welding process using a melting welding wire and a welding torch in which at least one mechanical adjustment process is carried out during the welding to determine the position of the welding wire using the welding wire as a sensor, contacting of the welding wire with a workpiece by moving the welding wire towards the workpiece, and after contacting of the welding wire with the workpiece, the welding wire is moved away from the workpiece to a fixedly pregiven or adjustable distance relative to the workpiece.

Accordingly, it is respectfully submitted that claim 21, together with claims 4-7 and 9-20 which depend directly or indirectly thereon, are patentable over the cited references.

In view of the foregoing, it is respectfully requested that the claims be allowed and that this application be passed to issue.

Respectfully submitted,
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